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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Frederick G. Walther

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EXAMINER

LIU, LI

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/603,071	Applicant(s) WALTHER ET AL.	
	Examiner LI LIU	Art Unit 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 11, 26, 27, 29-36, 39, 54-83, 85-98, 101-113, 117 and 118 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-8, 11, 26, 27, 29-36, 39, 54, 55, 57-83, 87-97, 103-113, 117 and 118 is/are allowed.
- 6) ☒ Claim(s) 56, 85, 86, 98, 101 and 102 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 February 1007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 56, 85, 86, 98, 101 and 102 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 85, 86 and 98 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: the polarization rotational devices (the quarter wave plate QWP or Faraday Rotator FR, labeled as 14 and 18 in Figure 6-8, 13 and 14; shown in detail in Figures 1 and 2).

The claims 85 and 98, and depending claim 86, recite the limitations: an aperture, a polarization element, a polarizing splitting element, a first stack of deflectors deflecting first respective electromagnetic signals, a second stack of deflectors deflecting second respective electromagnetic signals, and the first and second electromagnetic signals passing through the aperture.

In the original disclosure and the drawings (e.g., Figures 6-8, 13 and 14), the aperture and two stacks of deflectors are coupled by the polarization beam splitter (PBS) and two polarization rotational devices (the quarter wave plate QWP or Faraday Rotator FR, labeled as 14 and 18 in Figure 6-8, 13 and 14). And the polarization splitter

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splits the signal into two parts so that the each stack of deflector can deflect part of the signal; and the PBS is positioned “so that it is transparent to signals on 103 polarized along one direction, so that these signals travel along 104” (to the first stack of deflectors), and “reflects the signals with perpendicular polarization so that they travel along 105” (to the second stack of deflectors); and the polarization rotational devices QWP and FR are positioned “so that a signal for which the PBS 21 was transparent ends up being reflected on PBS, and vice versa” (page 9, line 24 to page 10 line 9). The polarization rotational devices (QWP or FR, labeled as 14 and 18 in Figure 6-8, 13 and 14, shown in detail in Figures 1 and 2) are essential to the stacks of reflectors and PBS (Figures 6-8, 13 and 14). While the device is for transmitting signals, without the polarization rotational devices, the reflected signal cannot properly redirected to the aperture; that is, without the polarization rotational devices, the two split signals (the first signals and second signals) cannot be recombined again and passed through the same aperture. While the device is for receiving signals, without the polarization rotational devices, the signal that is reflected by the PBS and deflected by the deflectors cannot pass through the PBS, or the signal that passes though the PBS and deflected by the deflectors cannot be reflected by the PBS; that is, without the polarization rotational devices, the two split signals (the first signals and second signals) cannot be recombined again and sent to the receiver.

4. Claims 101 and 102 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: positioning

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polarization rotation devices between the polarization splitting device and the stacks of deflectors, and passing the split first and second electromagnetic signals through the polarization rotation devices, and after being deflected, the first and second electromagnetic signals passing through the polarization rotation devices again.

The claim 101, and depending claim 102, recites the limitations: passing of electromagnetic signals by an aperture; altering a polarization of the electromagnetic signals; splitting the electromagnetic signals into first and second electromagnetic signals, deflecting first respective electromagnetic signals by a first stack of deflectors, deflecting second respective electromagnetic signals by a second stack of deflectors.

In the original disclosure and the drawings (e.g., Figures 6-8, 13 and 14), the aperture and two stacks of deflectors are coupled by the polarization beam splitter (PBS) and two polarization rotational devices (the quarter wave plate QWP or Faraday Rotator FR, labeled as 14 and 18 in Figure 6-8, 13 and 14). And the polarization splitter splits the signal into two parts so that the each stack of deflector can deflect part of the signal; and the PBS is positioned “so that it is transparent to signals on 103 polarized along one direction, so that these signals travel along 104” (to the first stack of deflectors), and “reflects the signals with perpendicular polarization so that they travel along 105” (to the second stack of deflectors); and the polarization rotational devices QWP and FR are positioned “so that a signal for which the PBS 21 was transparent ends up being reflected on PBS, and vice versa” (page 9, line 24 to page 10 line 9). Since the deflectors are reflectors (Species 1), the polarization rotational devices are essential to the stacks of reflectors and PBS. The method is used for communication

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(that is, for transmitting or receiving signals), when the method is for receiving signals, without the step of positioning the polarization rotational devices between the polarization splitting device and the stacks of deflectors and passing the electromagnetic signals through the polarization rotation devices twice, the reflected signals cannot properly be received by a receiver, e.g., the signals that are reflected by the PBS and deflected by the deflector would be redirected by the PBS towards the aperture again; and when the method is for transmitting signals, without the step of positioning the polarization rotational devices between the polarization splitting device and the stacks of deflectors and passing the electromagnetic signals through the polarization rotation devices twice, the two split and reflected signals (the first signals and second signals) cannot be recombined again and passed through the same aperture.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Polinsky et al (US 6,782,153) in view of Nagano et al (US 6,262,837).

Polinsky et al discloses a method for deflecting electromagnetic waves comprising:

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independently deflecting electromagnetic waves within a first wavelength band at a first dynamic angle (Figures 1B-1E, column 4 line 66 to column 5 line 10, the filter/deflector 155 reflects/deflects electromagnetic waves within a first wavelength band λ' at a first dynamic angle, Fig 1E shows that the angle of the filter/deflector 155 can be dynamically controlled, column 5 line 34-65) and passing electromagnetic waves within a second wavelength band by a first deflector (e.g., the filter/deflector 155 reflects/deflects passes electromagnetic waves within a second wavelength band λ towards deflector 300) through a first pass (Figure 1B-1E, e.g., the first pass is from lens 140 to the deflector 300); and

independently deflecting electromagnetic waves within a second wavelength band, at a second dynamic angle independent of the first angle (Figures 1B-1E, Figures 2 and 4 etc, column 5 line 9-30 etc, the reflective surface/deflector 300, or 107 in Figures 2 and 4, reflects/deflects electromagnetic waves within a second wavelength band λ at a second dynamic angle, Figures 1C, 2 and 4 show that the angle of the reflective surface/deflector 300/107 can be dynamically controlled, column 2, line 59-67, column 5 line 25-30, column 6 line 17-55 etc), by a second deflector (the reflective surface/deflector 300 in Figure 1, or 107 in Figures 2 and 4), the second deflector positioned to receive the electromagnetic waves passed through the first deflector (Figures 1, 2 and 4 etc, the second deflector 300/107 positioned to receive the electromagnetic waves λ passed through the first deflector 155/106) and passing the electromagnetic waves, deflected by the second deflector, through the first deflector through a second pass (the electromagnetic waves λ , deflected/reflected by the

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reflective surface/deflector 300/107, passes through the first deflector 155/106 through a second pass that is from the deflector 300/107 to the lens 140/103).

Polinsky et al discloses that either the first deflector is dynamically controlled (shown in Figure 1E) or the second deflector is dynamically controlled (shown in Figures 1C, 2 and 4). But Polinsky et al does not expressly state that both the first deflector and second deflector are dynamically controlled in the system.

However, Nagano et al also teaches a system and method that can control the dynamic angles of two wavelength filters (3a and 3b in Figure 4), the first and second wavelength shift filters 3a and 3b are inclined by the rotation drive of wavelength shift filter drive section 18, and the rotations are performed independently (column 8 line 10-14).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the dynamically controlling of both the first and second deflector as taught by Nagano et al to the system of Polinsky et al so that each wavelength band can be conveniently controlled by the deflectors, and any input band can be redirected to any desired output, and the system is more flexible.

Allowable Subject Matter

7. Claims 1-8, 11, 26, 27, 29-36, 39, 54, 55, 57-83, 87-97, 103-113, 117 and 118 are allowed.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LI LIU whose telephone number is (571)270-1084. The examiner can normally be reached on Monday-Friday, 8:30 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. L./

Examiner, Art Unit 2613

May 17, 2009

/Kenneth N Vanderpuye/

Supervisory Patent Examiner, Art Unit 2613